

S/N 09/847,479
Docket: FIS920000077US1

REMARKS

It is noted that the claim amendments herein are intended solely to more particularly point out the present invention for the Examiner, and not for distinguishing over the prior art or the statutory requirements directed to patentability.

It is further noted that, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

Claims 1-20 are all of the claims pending in the present Application.

Claims 1-20 are rejected under 35 USC § 112, first paragraph, because claims 1, 7, 11, and 17 are interpreted as claiming all dimensions below 100 nm. Applicants do not currently know the lower limit of the present invention, but testing has yielded a dimension of 40 nm, considerably below the prior art of record. However, Applicants believe the above claim amendments properly address the Examiner's concern and request that the Examiner reconsider and withdraw this rejection.

Claims 1, 2, 4-7, 9-11, and 13-20 stand rejected under 35 USC §102(e) as anticipated by US Patent 6,372,651 to Yang. Claims 1, 2, 7, and 11-20 stand rejected under 35 USC §102(e) as anticipated by US Patent Application Publication 2002/0142252 to Ng.

Claims 3 and 8 stand rejected under 35 USC §103(a) as unpatentable over Ng, further in view of US Patent 6,233,388 to Kim and US Patent 5,940,719 to Jang.

These rejections are respectfully traversed in view of the following discussion.

I. THE CLAIMED INVENTION

As described and claimed, the present invention is directed to a method of fabricating an electronic chip on a wafer. A first mask at a predetermined lower resolution is developed on a surface of a wafer. The first mask is etched under a first set of conditions for a predetermined period to achieve a higher resolution mask. The higher resolution is below 100 nm. The first set of conditions includes an a tuning parameter to independently control said line width variation tolerance of isolated features relative to nested features

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The prior art fails to teach, suggest or render obvious the etching recipe of the present invention. The advantage of this recipe is that it achieves a resolution below 100nm, while concurrently providing a parameter (RF power level, see claim 12) that allows for independently tuning for line width variations between isolated features and nested features.

Moreover, the present invention has controllably achieved dimensions considerably lower than 100nm, currently including test samples down to 40 nm.

II. THE PRIOR ART REJECTIONS

The Examiner alleges that claims 1, 2, 4-7, 9-11, and 13-20 are anticipated by US Patent 6,372,651 to Yang, and that claims 1, 2, 7, and 11-20 are anticipated by US Patent Application Publication 2002/0142252 to Ng.

The Examiner further alleges that claims 3 and 8 are rendered obvious by Ng, further in view of US Patent 6,233,388 to Kim and US Patent 5,940,719 to Jang.

However, a key feature of the present invention is that it achieves a dimension that is less than 100 nm, including values that are as low as 40 nm. Yang does not achieve a dimension below 180 nm, and, therefore, cannot reasonably be considered as anticipating the present invention.

Ng shows in Figure 2C a dimension of 70 nm but relies on an oxygen etch different from that of the present invention. Ng does not teach or suggest using RF power as a tuning parameter for the nested/isolated features. That is, Ng teaches using an oxygen etch recipe that does not include a parameter that tunes the nested/isolated line width variation.

Therefore, neither Ng nor Yang anticipates the present invention.

It is further pointed out that Ng, by reason of 35 USC § 103(c), by reason of being commonly assigned, and by reason of qualifying only as a reference under 35 USC § 102(e), cannot be used as a prior art for purpose of an obviousness rejection.

However, it is also pointed out that, even if Ng were available as a prior art reference, the Kim reference cannot be properly combined with Ng, since the Examiner relies on the description in Kim at lines 13-17 of column 4 as demonstrating that nitrogen added to oxygen adds controllability to the etch rate.

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Applicants submit that the Examiner is not entitled to surmise that adding nitrogen to the etch recipe in Ng would improve the effect described therein or, indeed, whether the result described in Ng would even be attainable as modified with the oxygen/nitrogen recipe suggested in Kim. That is, there is no indication in Kim that ease of control is possible while still maintaining accuracy that would be required in Ng. Moreover, Ng already teaches to use 5% CFO for increased stability (page 3, at [0044]).

Finally, Applicants again submit that the generic statement in lines 44-47 of column 5 of Jang has nothing significant to offer to overcome the above-identified deficiency in Ng, since it can only reasonably be interpreted as stating that different etching recipes will achieve different effects. This statement is quite different from that of teaching, suggesting, or rendering obvious the recipe provided in the present invention.

Hence, turning to the clear language of the claims, there is no teaching or suggestion of “... etching said first mask under a first set of conditions for a predetermined period to achieve a higher resolution mask, said higher resolution achieving a critical dimension of that is below 100 nm, said first set of conditions including a tuning parameter to independently control said line width variation tolerance of isolated features relative to nested features.” Similar language is present in independent claims 1, 7, and 17.

For the reasons stated above, the claimed invention is fully patentable over the cited references.

Further, the other prior art of record has been reviewed, but it too, even in combination with Yang, Ng, Kim, or Jang, fails to teach or suggest the claimed invention.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 1-20, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

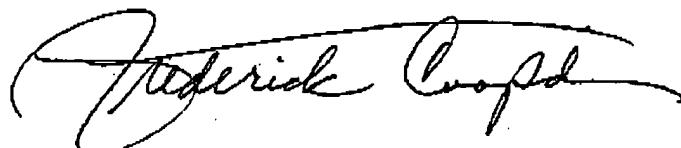
Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Assignee's Deposit Account No. 09-0458.

Respectfully Submitted,

Date: 7/21/03



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CERTIFICATION OF TRANSMISSION

I certify that I transmitted via facsimile to (703) 872-9311 this Amendment Under 37 CFR §1.116 to Examiner N. M. Barreca on July 21, 2003.



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